

1 **CLAIMS LISTING**
2

3 1. (Currently amended) A method of asynchronous data replication over a
4 network, wherein one or more applications send write commands to a primary host,
5 comprising:

6 at the primary host:

7 acknowledging each write command before transmitting the write command to a
8 secondary host;

9 assigning a data set ID to each write command;

10 transmitting each write command before the application has sent all of the write
11 commands of the data set to the primary host;

12 assigning the data set ID to a sync command;

13 transmitting the sync command, wherein the write commands and the sync
14 command define [a] the data set;

15 at the secondary host:

16 receiving the write commands and sync command out of order; and

17 writing the data set to a storage coupled to the secondary host.
18

19 2. (Currently amended) The method of claim 1, further comprising tracking
20 the receipt of the write and sync commands at the secondary host.
21

22 3. (Original) The method of claim 2, further comprising assigning a unique
23 sequence number for each write command and another sequence number to the sync
24 command at the primary host.
25

26 4. (Currently amended) The method of claim 3, wherein tracking the receipt
27 of the write and sync commands includes setting bits in an identifier bitmap
28 corresponding to the data set at the secondary host.
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1 5. (Currently amended) The method of claim 1, further comprising writing
2 ~~the blocks~~ a block of the data set to a secondary target VLUN and acknowledging the
3 write and sync commands before receipt of the data set at the secondary host.

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5 6. (Currently amended) The method of claim 1, further comprising storing
6 multiple versions of one of the blocks of the data set at the primary host while waiting for
7 an acknowledgement from the secondary host.

8
9 7. (Original) The method of claim 4, further comprising using the identifier
10 bitmap to determine receipt of the data set at the secondary host.

11
12 8. (Currently amended) The method of claim [3] 5, further comprising
13 updating a data structure at the secondary host to track [the] blocks of the data set in
14 the secondary target VLUN.

15
16 9. (Original) The method of claim 8, wherein updating the data structure at
17 the secondary host includes setting bits in a bitmap and updating a log file.

18
19 10. (Currently amended) The method of claim 1, further comprising writing
20 [the] blocks of the data set to a memory buffer at the secondary host and
21 acknowledging the write and sync commands at the secondary host before receipt of
22 the data set.

23
24 11. (Original) The method of claim 1, wherein the step of receiving at the
25 secondary host includes receiving write commands belonging to a plurality of data sets
26 that are overlapping with respect to each other.

27
28 12. (Currently amended) The method of claim 1, further comprising receiving
29 a second data set at the secondary host, wherein the step of receiving write commands
30 for the second data set precedes receiving the write commands of the data set.

1 13. (Currently amended) The method of claim [1] 11, further comprising
2 storing the data sets in a plurality of data structures.

3
4 14. (Original) The method of claim 1, further comprising transmitting the write
5 and sync commands on the network using the Fibre channel protocol.

6
7 15. (Original) The method of claim 1, further comprising transmitting the write
8 and sync commands on the network using the iSCSI protocol.

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10 16. (Currently amended) The method of claim 1, wherein the step of writing
11 includes the secondary host writing the blocks of the data set to [the] a secondary
12 source VLUN.

13
14 17. (Original) The method of claim 1, wherein the data set contains one or
15 more file system transactions.

16
17 18. (Currently amended) A system of asynchronous data replication,
18 comprising:
19 a primary host asynchronously transmitting write commands and [a] sync
20 ~~command~~ commands, wherein each write command has a data set ID and each sync
21 command has a data set ID; and
22 a secondary host, coupled to the primary host, tracking receipt of the write and
23 sync commands and after receipt of the write and sync commands ~~of the data set ID~~
24 writing the write commands to a storage coupled to the secondary host.

25
26 19. (Currently amended) The system of claim 18, further comprising a data
27 structure at the secondary host for tracking receipt of the write and sync commands.

28
29 20. (Original) The system of claim 19, wherein the data structure includes a
30 flag to indicate when the write commands and the sync command of a data set are
received at the secondary host.

1 21. (Currently amended) The system of claim 20, wherein the secondary host
2 writes the data set to the storage after a temporary failure of the secondary host if the
3 flag indicates that the write and sync commands of the data set were received.

4
5 22. (Currently amended) A system of asynchronous data replication,
6 comprising:

7 a primary host asynchronously transmitting write and sync commands for a first
8 data set and a second data set; and

9 a secondary host, coupled to the primary host, receiving and writing the write and
10 sync commands ~~and writing the data set~~ to storage, wherein the primary host transmits
11 write and sync commands for the second data set before the secondary host
12 acknowledges the first data set was written to storage.

13
14 23. (Currently amended) A system of asynchronous data replication,
15 comprising:

16 a primary host asynchronously transmitting write commands and ~~the blocks~~ over
17 a network without waiting to complete a data set ~~followed by~~ with a sync command; and

18 a secondary host coupled to the network receiving the write commands, the
19 blocks, and the sync command in any order, wherein the secondary host writes the data
20 set to storage coupled to the secondary host.

21
22 24. (Original) A system of asynchronous data replication, comprising:

23 a primary host receiving write commands from an application, generating sync
24 commands, and transmitting the write and sync commands over a network
25 asynchronously and independently from one or more data sets; and

26 a secondary host, coupled to the network, receiving the write and sync
27 commands out of order and writing the data sets in order to storage coupled to the
28 secondary host.

1 25. (Original) A method of data replication, comprising the steps of:
2 transmitting a data set from a primary host to a secondary host wherein the
3 secondary host includes a data structure with a complete flag;
4 writing the data set to a target VLUN at the secondary host;
5 setting the complete flag = yes once the data set is written to the target VLUN at
6 the secondary host; and
7 writing the data set to a source VLUN at the secondary host.

8
9 26. (Original) A method of data replication comprising the steps of:
10 transmitting a data set from a primary host to a secondary host wherein the
11 secondary host includes a data structure with a complete flag;
12 writing the data set to a target VLUN at the secondary host;
13 setting the complete flag = yes once the data set is written to the target VLUN at
14 the secondary host;
15 resuming operation of the secondary host after a failure; and
16 writing the data set to a source VLUN at the secondary host.

17
18 27. (Original) A method of data replication comprising the steps of:
19 transmitting a data set from a primary host to a secondary host wherein the
20 secondary host includes a data structure with a complete flag;
21 writing part of the data set to a target VLUN at the secondary host;
22 resuming operation of the secondary host after a failure;
23 erasing the part of data set written to the target VLUN at the secondary host;
24 retransmitting the data set from the primary host to the secondary host;
25 writing the data set to the target VLUN at the secondary host;
26 setting the complete flag = yes once the data set is written to the target VLUN at
27 the secondary host; and
28 writing the data set to a source VLUN at the secondary host.
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